UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER
WONG, LINDA

ART UNIT	PAPER NUMBER
2611	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

	Application No.	**Applicant(s)**
Office Action Summary	10/766,742	FIMOFF ET AL.
	Examiner	**Art Unit**	
	Linda Wong	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>*27 January 2004*</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,14-16,27 and 28* is/are rejected.

7)☒ Claim(s) *3-13,17-26 and 29* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>*27 January 2004*</u> is/are: a)☐ accepted or b)☒ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

        1.☐ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____.

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. Figures 1-4 should be designated by a legend such as --Prior Art-- because only

that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in

compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid

abandonment of the application. The replacement sheet(s) should be labeled

"Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to

obstruct any portion of the drawing figures. If the changes are not accepted by the

examiner, the applicant will be notified and informed of any required corrective

action in the next Office action. The objection to the drawings will not be held in

abeyance.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

2. **Claims 1,2,13-16** are rejected under 35 U.S.C. 103(a) as being unpatentable over

Chu et al (US Patent No.: 6934345) in view of Yousef (US Publication No.:

20030152170).

   a. **Claim 1**,

      i.   Chu et al discloses

- "supplying output data sections of received symbols at an output rate of nS such that void times separate the output data sections, wherein n > 1" (Fig. 7, label 115, wherein k/T is the sampling rate and k > 1, Col. 6, lines 53-56. Regarding the limitation "void times", void times would be found between the outputted data sections.)

- equalizing the symbols (Fig. 7, label 105)

- "decoding the equalized symbols by a decoder to provide decoded symbols" (Fig. 7, label 140)

- "calculating adjustments for the decision feedback equalizer during the void times such that the adjustments are calculated based on both the received symbols supplied by the decision feedback equalizer buffer and the decoded symbols" (Fig. 7, label 115, wherein the input to the equalizer would be at a rate of k/T. Regarding the limitation "void times", since the input to the equalizer is scheduled by the switch 115, the error is calculated for each of the samples outputted from the equalizer. The error is calculated when the outputted equalized sample is passed to the decoder. Since the sampled outputted by the equalizer depends on label 115 and 125, the error would be calculated at the void times caused by labels 115 and 125.)

- "applying the adjustments to the decision feedback equalizer" (Fig. 7, label 170)

ii.   Chu et al fails to disclose

- "continuously storing input data segments of received symbols in a decision feedback equalizer buffer at a symbol rate S",

- "equalizing the received symbols supplied by the decision feedback equalizer buffer in a decision feedback equalizer to provide equalized symbols"

iii.   Yousef discloses such a limitation. (Fig. 18, label 1820, Fig. 16, label 1610,1620 and Fig. 9, label 920) It would have been obvious to one skilled in the art at the time of the invention to incorporate a buffer for storing the data inputs as disclosed by Yousef into Chu et al's invention so to allow access to data at any time.

b.   **Claim 2**, Chu et al disclsoes "n=3". (Col. 6, lines 53-56)

c.   **Claim 13**,

i.   Chu et al discloses "the decision feedback equalizer comprises taps having tap weights" and "applying the calculated tap weights to the decision feedback equalizer". (Col. 5, lines 39-67, Col. 6, lines 1-4)

ii.   Chu et al fails to disclose

- "wherein the calculating of adjustments for the decision feedback equalizer comprises (i) estimating a channel impulse response based on the received symbols supplied by the decision feedback equalizer buffer and based on the decoded symbols, and (ii) calculating the tap weights for the decision feedback equalizer based on the estimated channel, and wherein the applying of the adjustments to the decision

feedback equalizer comprises applying the calculated tap weights to the

decision feedback equalizer".

iii.   Yousef discloses such a limitation. (Fig. 8, label 825 shows a channel

estimator, Fig. 16, labels 1610-1630 shows the data stored is being used to

determine channel estimation, Fig. 17, labels 1720,1740,1760 shows the

channel estimation being used for updating taps.)

d. **Claim 14**,

i.   Chu et al discloses

- "continuously storing input data segments of received symbols in a

    decision feedback equalizer buffer at a symbol rate S"

- "supplying output data sections of received symbols from the decision

    feedback equalizer buffer at an output rate of nS such that void times

    separate the output data sections, wherein n > 1" (Fig. 7, label 115,

    wherein k/T is the sampling rate and k > 1, Col. 6, lines 53-56.

    Regarding the limitation "void times", void times would be found

    . between the outputted data sections.)

- equalizing the symbols (Fig. 7, label 105)

- "decoding the equalized symbols by a decoder to provide decoded

    symbols" (Fig. 7, label 140)

ii.   Chu et al fails to disclose

- "equalizing the received symbols supplied by the decision feedback

    equalizer buffer in a decision feedback equalizer to provide equalized

symbols, wherein the decision feedback equalizer comprises taps

having tap weights"

- "estimating a channel impulse response based on both the received

  symbols supplied by the decision feedback equalizer buffer and the

  decoded symbols"

- "calculating the tap weights for the decision feedback equalizer based

  on the estimated channel, wherein the estimating of the channel

  impulse response and the calculating of the tap weights are performed

  during the void times; and"

- "applying the calculated tap weights to the decision feedback

  equalizer".

iii. Yousef discloses such limitations. (Fig. 9, label 920 shows an equalizer

receiving data from the buffer, label 915, Fig. 8, label 825 shows a channel

estimator, Fig. 16, labels 1610-1630 shows the data stored is being used to

determine channel estimation, Fig. 17, labels 1720,1740,1760 shows the

channel estimation being used for updating taps, Fig. 9, label 925,930 and

920 show applying the updated taps to the equalizer.) It would have been

obvious to one skilled in the art at the time of the invention to incorporate a

buffer for storing the data inputs as disclosed by Yousef into Chu et al's

invention so to allow access to data at any time.

e. **Claim 15**, Chu et al discloses "n>=2". (Col. 6, lines 53-56)

f. **Claim 16**, Chu et al discloses "n=3". (Col. 6, lines 53-56)

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3.   **Claims 27-28** are rejected under 35 U.S.C. 102(b) as being anticipated by Chu et al

(US Patent No.: 6934345).

a.   **Claim 27,**

i.   Chu et al discloses

- "supplying segments of received symbols to the equalizer to produce

equalized segments, wherein each of the segments of received

symbols occupies a corresponding segment time period" (Fig. 7, label

115 for supplying segments of received symbols to the equalizer, label

105 to produce equalized segments, wherein each segment would

occupy a segment time period.)

- "decoding the equalized segments by a decoder to produce decoded

segments"; (Fig. 7, label 140)

- "calculating adjustments for the equalizer based on n decoded

segments and n segments of received symbols, wherein n >=1, and

wherein the calculating of adjustments" (Fig. 7, label 170 error

calculated for adjusting the equalizer, label 115,125 determines the

segment to be decoded, label k/T for the number of segments sampled

and inputted into the equalizer, k>1, Col. 6, lines 55-65, wherein there

will be at least 1 equalized segment of symbols used for decoding and

at least 1 segment of symbols equalized.)

   b. **Claim 28,** Chu et al discloses "n=3". (Col. 6, lines 55-65)

Allowable Subject Matter

4. **Claims 3-12,17-26,29** are objected to as being dependent upon a rejected base

claim, but would be allowable if rewritten in independent form including all of the

limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the
examiner should be directed to Linda Wong whose telephone number is 571-272-6044.
The examiner can normally be reached on 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's
supervisor, David Payne can be reached on (571) 272-3024. The fax phone number for
the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the
Patent Application Information Retrieval (PAIR) system. Status information for
published applications may be obtained from either Private PAIR or Public PAIR.
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For more information about the PAIR system, see http://pair-direct.uspto.gov. Should
you have questions on access to the Private PAIR system, contact the Electronic
Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a
USPTO Customer Service Representative or access to the automated information
system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Linda Wong
6/18/2007

DAVID C. PAYNE
SUPERVISORY PATENT EXAMINER